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SEARCH

Go

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You are in: **Science/Nature**

NewsFront Tuesday, 7 January, 2003, 23:03 GMT

Page **Black hole 'on a diet'****World****UK****England****N Ireland****Scotland****Wales****Politics****Business****Entertainment****Science/Nature****Technology****Health****Education****Talking Point****Country Profiles**
In Depth**Programmes**

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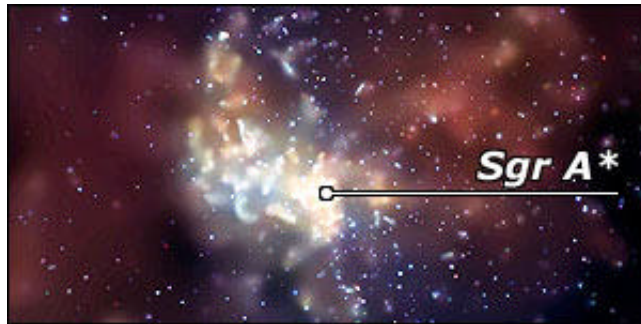
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It seems the supermassive black hole that sits at the centre of our galaxy, the Milky Way, is famished.

The latest data from the orbiting Chandra observatory shows the object's X-ray emissions are quite weak, suggesting relatively little gas is falling into the hole at times.

Scientists think this is because previous violent explosions may have cleared matter away from the immediate vicinity of the hole.

“ Although it appears to snack often, this black hole is definitely on a severe diet ”

Frederick Baganoff,
MIT

Known as Sagittarius A* or Sgr A*, because of its position in the southern sky, the black hole at our galaxy's core is calculated to have a mass 2.6 million times that of the Sun.

Its presence has been established by measuring the tremendous speeds - 5,000 kilometres (3,000 miles) per second - of stars skirting the hole's edge, or event horizon.

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Red loops

Chandra made the longest X-ray exposure of the region to date. In addition to Sgr A*, more than two thousand other X-ray sources were detected, making this one of the richest fields ever observed.

During the two-week observation period, Sgr A* flared up in X-ray intensity half a dozen or more times. The cause of these outbursts is not understood, but the rapidity with which they rise and fall indicates that they are occurring near the event horizon.

"We are getting a look at the everyday life of a supermassive black hole like never before," said Frederick Baganoff of the Massachusetts Institute of Technology (MIT), US, who presented the new data on behalf of an international team at the American Astronomical Society meeting in Seattle.

"We see it flaring on an almost daily basis," he said.

Evidence of past explosions is revealed in the image - huge lobes of 20-million-degree Celsius gas (the red loops in the image at approximately the 2 o'clock and 7 o'clock positions) that extend over dozens of light-years on either side of the black hole.

Exotic phenomena

Astronomers say these enormous explosions occurred several times over the last 10,000 years.

"Although it appears to snack often, this black hole is definitely on a severe diet," said Baganoff. "This could be because explosive events in the past blew away

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much of the gas from the neighbourhood of the black hole," he explained.

Black holes are among the most exotic phenomena in the Universe.

Theory suggests they are point-like objects that have such strong gravitational attraction that all matter that comes too close is sucked in - not even light can escape their influence.

Some are thought to form when dying stars collapse in on themselves. But there is also growing evidence that most if not all galaxies contain other, much bigger black holes at their cores.

How these supermassive objects are created and how they relate to the creation and evolution of galaxies is a mystery. Chandra hopes to provide some answers by studying the high-energy radiation that is emitted when matter is ripped apart on its journey in a hole.

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